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purpose of the present paper was to point out a practical corrective of this inequality of movement: and the following was laid down as a general theorem, of which, in any special case, it is not difficult to give mathematical proof. If a part of the machinery can be selected, so connected with the revolving parts, that when the balls revolve in a circle, that part will be at rest, and when the balls revolve in an ellipse that part will oscillate; and if the movement of that part be subject to friction; then the oscillation and the ellipticity of movement will infallibly be diminished: and if the friction follow such a law that, as the motion diminishes, the friction becomes less than any assignable quantity, then the ellipticity of movement will be diminished without influencing the rate of the clock. The only kind of friction which appears proper for this purpose is the resistance of a perfect fluid to the motion of a plate through it.

Two instances were then pointed out, in which this principle had been successfully applied, though in different ways. The first is in the clock-work of the Liverpool equatoreal; the expansion of the centrifugal balls causes a slider upon the vertical spindle to rise, and elliptic motion of the balls therefore produces oscillation of the slider; the slider is connected by a lever with a plate of metal moving in a vessel of water; and the resistance of this water to the movement of the plate quickly reduces elliptic to circular movement, and produces no effect whatever on the circular movement. The second is in clock-work now in construction for giving uniform movement to a barrel intended to receive the record of transits in the American manner: in this clock-work, which is constructed on principles explained in a former discourse to the Society, a wheel of the clock-train drives the wheel that revolves with the pendulum by the intermediation of a wheel, which is partially free: elliptic motion of the pendulum therefore produces oscillation of the frame carrying the intermediate wheel. This frame is connected with plates moving in vessels of water; and here also the resistance very rapidly reduces the elliptical to circular motion. The President concluded by saying that he considered the practical problem of producing smooth and uniform motion to be now completely solved.

Observations of the Planet Saturn, accompanied by his eight Satellites, Nov. 21, 1850, at about 9^m 20^h *G.M.T.**

By Mr. Lassell.

"The sky cleared at about 8 P.M., and on going into the observatory at $8\frac{1}{2}$ I found the atmosphere very fine. I scrutinised the planet for some time, with various powers, *e.g.* 219, 567, 614.

* It will be seen that the notices respecting *Saturn*, his rings and satellites, do not admit of classification, without altering the *form* of the communications. The division in the *outer* ring was seen by MM. Lassell and Dawes. Mr. Bond discovered the *inner dusky* ring, which was partially seen by Mr. Lassell just before he read of Mr. Bond's discovery.

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I several times suspected a second division of the outer ring at both ansæ, but could not *absolutely* verify it. The appearance I saw, or suspected, was a line one-third of the breadth of the outer ring from its outer edge.*

" *Mimas* was first detected with 614, and afterwards seen, even more pleasantly and steadily, with 219, and without any hiding of the planet. Indeed, all the satellites, but *Hyperion*, were exhibited in one view with this power. The sky was very light from the bright moon, and I could not find *Hyperion* with any lower power than 614. I had not calculated its place, nor had I the slightest idea at the moment where it was to be found. When I had detected it, I was astonished by its faintness, and am persuaded that it must vary considerably in brightness, and that when *first* discovered it must have been even at an unusual maximum. I had the greatest difficulty in measuring its position, and was obliged to take its distance from a star in the first instance, and afterwards ascertain the distance of that star from the planet. The dusky south pole and ruddy belt of *Saturn* were very remarkable. The shadow of the ring upon the ball seemed serrated, and the upper edge of the ring crossing the ball seemed a *dark line,* not so broad or strongly marked, however, as the shadow below it.

" The following are measures in position and distance, along and at right angles to a parallel of declination, which may serve, at least, as an approximate epoch of the places of the satellites. The nearest four are estimated: the others are micrometrically measured:—

	″		″		
Mimas	4	South	23	West	Estimated.
Enceladus	6	—	20	East	
Tethys	5	North	28	West	
Dione	10	South	38	West	
Rhea	2	North	80	West	Measured.
Titan	16	South	157	West	
Hyperion	32	North	119·5	East	
Japetus	76	South	201	East	

" A more accurate epoch, however, of the satellites *Titan* and *Rhea*, will be furnished by reference to some observations I made on the 13th Sept., of an inferior conjunction of both of them with the planet.

" 1850, Sept. 13,

$11^{h}\ 55^{m}\ 23^{s}$ G.M.T., *Rhea* is optically in conjunction with *Saturn;* a mean of 3 micrometrical measures gave the satellite 18″·0 north of the planet's centre. *Titan* is approaching conjunction, but is evidently a little short.

$11^{h}\ 59^{m}\ 38^{s}$, *Rhea* is not sensibly past conjunction.

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* Mr. Lassell sent a sketch showing the position and appearance of this division, which is seen in the woodcut at p. 24.

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12^h^ 3^m^ 40^s^, *Rhea* is now, I think, past conjunction, and *Titan* is very near it.

12^h^ 15^m^, *Titan* is now fully up to conjunction, and *Rhea* evidently past.

12^h^ 24^m^, *Titan* is now, I think, *rather* beyond conjunction, but the atmosphere is exceedingly unfavourable.

12^h^ 27^m^, *Titan* is now apparently past.

A mean of 3 measures gave *Titan* 39″·4 north of *Saturn's* centre. I estimate the most probable time of conjunction of *Rhea* to be 11^h^ 58^m^, and of *Titan*, 12^h^ 15^m^ G.M.T.

Interior Ring of Saturn.

Great interest has been excited by the discovery at Cambridge, U. S. of an additional *inner* ring to *Saturn*. This was announced in the *Liverpool Albion* by the following paragraph, which was copied into *The Times* of Dec. 3d, 1850:—

" *Discovery of a Third Ring round the Planet Saturn.*— Letters received from Boston by the Africa announce the discovery, on the night of the 15th ult., of a third ring round the planet *Saturn* —a phenomenon which had been for some time suspected. It was announced that this important fact was ascertained by the astronomers at the Observatory at Cambridge. It is interior to the two others, and therefore its distance from the body of *Saturn* must be small. It was well observed through the great equatoreal, with powers varying from 150 to 900; the evening for astronomical observations being remarkably fine, perhaps the finest since the establishment of the Observatory, although, singularly enough, the sky was so hazy, that to the naked eye only the brighter stars were visible. It will be remembered, that the eighth satellite of this planet was also discovered at Cambridge, by Mr. Bond, about two years since."

We believe that no information has been received *directly* from Mr. Bond; but Capt. Smyth has had a letter from the Honourable Edward Everett (dated 26th November last), from which the following extract is taken:—

" Mr. Bond has lately announced the discovery of a third ring of *Saturn*, interior to the other rings. This is not to be confounded with Struve's supposed resolution of the other rings, which Mr. Bond's observations do not confirm. The new ring is believed by Mr. Bond to be thicker than the other rings. Before he had ascertained its existence as a separate body, and while he supposed it to be a part of the inner of the hitherto known rings, he supposed that the thickness of the latter was not uniform, but that it increased towards the planet. This appearance he now refers to the greater thickness of the edge of the newly-discovered ring. He is entirely confident of the reality of the discovery; and such are Mr. B.'s accuracy and caution, that I think it may fully be depended upon.